Appl. No.: 09/724,691
Amdt. Dated: 11/17/2003
Off. Act. Dated: 07/17/2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended): A catheter for controlling blood flow to a ~~branch vessel of a blood vessel~~ plurality of renal arteries via their respective renal ostia at unique relative locations along an abdominal aorta in a patient, comprising:

a) an elongated shaft with a proximal end portion and a distal end portion that is adapted to be positioned at a location within the abdominal aorta associated with the renal ostia when the proximal end portion is located externally of the patient;

b) a tubular member ~~on a distal section of the shaft~~ coupled to the distal end portion and having an interior passageway which is radially expandable within ~~a blood vessel~~ the location along the abdominal aorta to a configuration that is adapted to separate blood flow through the ~~blood vessel~~ abdominal aorta at the location into an outer blood flow stream exterior to the tubular member and an inner blood flow stream within the interior passageway of the tubular member, and which is configured to extend within the ~~blood vessel~~ abdominal aorta upstream and downstream of ~~a branch vessel~~ the renal ostia; ~~and~~

c) a radially expandable member ~~on~~ located along the tubular member, and having an expanded configuration with an outer diameter larger than an outer diameter of the tubular member and which is configured to direct at least part of the blood flow in the outer blood flow stream into the ~~branch vessel~~ renal ostium; and

d) a fluid agent delivery system that is adapted to couple to a source of fluid agent located externally of the patient and cooperating with the tubular member and radially expandable member so as to deliver a volume of the fluid agent from the source and into the outer blood flow stream.

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2. (currently amended): The catheter of claim 1 wherein the fluid agent delivery system comprises:

~~elongated shaft has~~ at least one lumen ~~therein~~ extending along the elongated shaft and in fluid communication with ~~at least one~~ a distal agent delivery port ~~in a distal section of the shaft~~ located along the distal end portion and a proximal agent delivery port located along the proximal end portion, and wherein the radially expandable member is downstream of the agent delivery port.

3. (currently amended): The catheter of claim 2, wherein the tubular member has an upstream end located upstream of the distal agent delivery port.

4. (currently amended): The catheter of claim 2, wherein the tubular member has a distal end located distal to the distal agent delivery port.

5. (currently amended): The catheter of claim 2, wherein the distal agent delivery port is a lateral port in a side wall of the shaft.

6. (withdrawn): The catheter of claim 1, wherein the radially expandable member comprises an inflatable balloon, and the shaft includes an inflation lumen and an inflation port in fluid communication with an interior of the balloon.

7. (withdrawn): The catheter of claim 1, wherein the radially expandable member comprises a radially enlarged section of the tubular member.

8. (currently amended): The catheter of claim 1, wherein the tubular member comprises a braided tube having a sheath.

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9. (currently amended): The catheter of claim 8, ~~including~~ further comprising:

a pull line having a distal end attached to the tubular member, and wherein the interior passageway of the tubular member is radially expanded by proximally retracting the pull line.

10. (currently amended): The catheter of claim 1, wherein the tubular member is self expanding.

11. (currently amended): The catheter of claim 10, wherein the tubular member comprises a radially collapsible frame having a sheath.

12. (withdrawn): The catheter of claim 10, wherein the tubular member comprises a sheet configured to unwind from a wound low profile configuration to an unwound radially expanded configuration to thereby radially expand the interior passageway of the tubular member.

13. (withdrawn): The catheter of claim 1, wherein the tubular member comprises a plurality of tubular balloons joined together, each tubular balloon being joined to adjacent tubular balloons along a length thereof to thereby define the tubular member interior passageway.

14. (withdrawn): The catheter of claim 1, wherein the tubular member is conically shaped having a smaller diameter end and a larger diameter end.

15. (withdrawn): The catheter of claim 14, wherein the radially expandable member is formed by the larger diameter end of the conical tubular member.

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16. (currently amended): The catheter of claim 1, wherein the interior passageway of the tubular member has an expanded inner diameter of between about 30 mm to about 130 mm.

17. (currently amended): The catheter of claim 1, wherein the interior passageway of the tubular member has an unexpanded inner diameter configured to expand to an expanded inner diameter, wherein the expanded inner diameter is between about 1000% to about 6000% larger than the unexpanded inner diameter.

18. (currently amended): A method of controlling blood flow to a ~~branch vessel of a blood vessel~~ plurality of renal arteries via their respective renal ostia at unique relative locations along an abdominal aorta in a patient, comprising:

a) providing a catheter comprising

i) an elongated shaft with a proximal end portion and a distal end portion that is adapted to be positioned at a location within the abdominal aorta associated with the renal ostia;

ii) a tubular member on the distal ~~section of the shaft~~ end portion having an interior passageway which is radially expandable within ~~a blood vessel~~the abdominal aorta at the location, and which is configured to extend within the ~~blood vessel~~ abdominal aorta upstream and downstream of ~~a branch vessel~~ the renal ostia; and

iii) a radially expandable member on the tubular member, having an expanded configuration with an outer diameter larger than an outer diameter of the tubular member and which is configured to decrease the blood flow in the outer blood flow stream downstream of the ~~branch vessel~~ renal ostia; ~~and~~

b) advancing a the distal end portion ~~of the catheter~~ to the location within the patient's ~~descending~~ abdominal aorta, so that an upstream end of the tubular member

is upstream of the ~~branch vessel~~ renal ostia and the radially expandable member is downstream of the ~~branch vessel~~renal ostia;

c) expanding the tubular member to separate blood flow through the ~~blood vessel~~ abdominal aorta into an outer blood flow stream exterior to the tubular member and an inner blood flow stream within the interior passageway of the tubular member; and

d) expanding the radially expandable member to the expanded configuration to thereby decrease the blood flow in the ~~outer blood flow~~ outer blood flow stream downstream of the ~~at least one renal artery~~ renal ostia.

19. (currently amended): The method of claim 18, ~~including~~ further comprising:

expanding the radially expandable member into contact with a wall of the ~~blood vessel~~ abdominal aorta to substantially occlude the outer blood flow stream downstream of the ~~branch vessel~~ renal ostia.

20. (currently amended): The method of claim 18, ~~including~~ further comprising:

expanding the radially expandable member to an outer diameter which does not completely occlude the outer blood flow stream downstream of the ~~branch vessel~~renal ostia.

21. (currently amended): A catheter for delivering a therapeutic or diagnostic agent to a ~~branch vessel of a blood vessel~~ plurality of renal arteries via their respective renal ostia at unique relative positions along an abdominal aorta in a patient, comprising:

a) an elongated shaft ~~having~~ with a proximal section, a distal section, and at least one lumen ~~therein~~ in fluid communication with at least one agent delivery port [in a] along the distal distal section of the shaft;

b) a tubular member on the distal section of the shaft having an interior passageway which is radially expandable within ~~a blood vessel~~ the abdominal aorta at the location so as to separate blood flow through the ~~blood vessel~~ abdominal aorta at the location into an outer blood flow stream exterior to the tubular member and an inner blood flow stream within the interior passageway of the tubular member, and which is configured to extend within the ~~blood vessel~~ abdominal aorta upstream and downstream of ~~a branch vessel~~the renal ostia; and

c) a radially expandable member on the tubular member, downstream of the ~~shaft~~ agent delivery port, having an expanded configuration with an outer diameter larger than an outer diameter of the tubular member and which is configured to decrease the blood flow in the outer blood flow stream downstream of the ~~branch vessel~~renal ostia.

22. (currently amended): A method of delivering a therapeutic or diagnostic agent to a patient's ~~kidney~~kidneys from a location within an abdominal aorta associated with a plurality of uniquely located renal ostia of a plurality of renal arteries, respectively, in the patient, comprising:

a) providing a catheter comprising

i) an elongated shaft having at least one lumen therein in fluid communication with at least one agent delivery port in a distal section of the shaft;

ii) a tubular member on the distal section of the shaft having an interior passageway which is radially expandable within ~~a blood vessel~~ the abdominal aorta, and which is configured to extend within the ~~blood vessel~~ abdominal aorta upstream and downstream of ~~a branch vessel~~the plurality of renal ostia; and

iii) a radially expandable member on the tubular member, downstream of the shaft agent delivery port, having an expanded configuration with an outer diameter ~~larger than an outer diameter~~ larger than an outer diameter of the tubular member and

which is configured to decrease the blood flow in the outer blood flow stream downstream of the ~~branch vessel~~renal ostia; and

b) advancing a distal portion of the catheter within the patient's ~~descending~~ abdominal aorta so that the agent delivery port is upstream or adjacent to ~~at least one renal artery of the patient~~renal ostia, and the radially expandable member is downstream of the ~~at least one renal artery~~renal ostia;

c) expanding the tubular member to separate blood flow through the ~~descending~~ abdominal aorta into an outer blood flow stream exterior to the tubular member and an inner blood flow stream within the interior passageway of the tubular member;

d) expanding the radially expandable member to the expanded configuration to thereby decrease the blood flow in the outer blood flow stream downstream of the ~~at least one renal artery~~renal ostia; and

e) flowing a therapeutic or diagnostic agent from the shaft lumen to the agent delivery port and into the outer blood flow stream in the abdominal aorta~~,~~ in a manner so as to deliver the therapeutic or diagnostic agent to the ~~at least one renal artery~~renal arteries via the renal ostia, respectively.